REVIEWS.

LEÇONS SUR LES FONCTIONS MOTRICES DU CERVEAU, ET SUR L'ÉPILEPSIE CÉRÉBRALE. Par le Dr. François Frank. Cours du Collège de France, 1884–85, pp. ix., 570. Paris: O. Doin, 1887. LECTURES ON THE MOTOR FUNCTIONS OF THE BRAIN AND ON CEREBRAL EPILEPSY. By Prof. François Frank.

Prof. François Frank has made a number of important contributions to physiology, some of which are more original than the present work; but none have been more thorough and careful than those recorded in this volume. In it he gives the result of extensive experimental researches upon the motor functions of the brain, going over the same ground which has been covered by the classical works of Fritsch and Hitzig, Munk, Ferrier, and Luciani, and coming to conclusions which agree very fully with theirs. His experiments have been upon the cortex of the brain in dogs and monkeys, and he has irritated the various areas by the faradic and galvanic currents, producing irritative manifestations. He reaffirms what has been so often proven, that the motor area is about the transverse fissure; that its upper third is related to movements of the leg; its middle third to those of the arm, and the lower third to those of the face, of the opposite side; but he does not localize the movements any more exactly than this, as has been done by Ferrier. He finds that the motor tract is not as excitable as the cortex, it being necessary to use a stronger current upon the fibres in the centrum ovale or internal capsule to produce the same movements. Irritation of the basal ganglia does not cause movements, an assertion which differs from that of other observers. A number of electric shocks to the cortex, any one of which is insufficient to cause a motion, will, if repeated at very short intervals, produce one ; a fact to which he gives the name of the cumulative action of the cortex. And a long-continued excitement reduces, and finally suspends, the excitability. These results of experiment are carefully recorded by the graphic method, which has not before been used in such experiments ; so that the degrees of muscular contraction, and the time elapsing between irritation and result, are here accurately determined. And the results reached are then compared with the phenomena presented by patients suffering from cortical epilepsy. It is this feature of the book which adds greatly to its value—the comparison of clinical and experimental facts being fully worked out. One interesting fact from a number may be selected as an example. He found that moderate irritation of the motor area will produce an epileptic fit in an animal, and that, after this fit has occurred, the animal is thereby rendered susceptible to the recurrence of such fit on irritation in any area of the cortex ; whereas, irritation of the occipital lobe in an animal which has never had such an artificially induced fit will not produce a convulsion. This is compared to the well-known clinical fact that the occurrence of a single epileptic convulsion predisposes the individual to a subsequent attack under sufficient physical or mental excitement. That the irritation of the cortex in order to produce a fit, must either originate in, or extend to, the motor area of the brain, is also conclusively proven by the author. Cortical epilepsy begins with a tonic spasm, followed by clonic spasms, which are at first slight, then severe. Reflex epilepsy, on the other hand, begins with large clonic spasms, and if a tonic spasm occurs it is in the midst of the fit, as an evidence of cumulative excitement. No one who is familiar with the clinical features of Jacksonian epilepsy can fail to be exceedingly interested with the experiments and conclusions bearing on this disease.

The effects of electrical irritation of the cortex upon the respiration, vascular tone, heart action, pupillary contraction, secretion of saliva and sweat, and excretion of urine, are very carefully investigated, and in the lectures upon these experiments much that is new is to be found. Frank does not consider it justifiable to conclude, as Ferrier does, that because irritation of a part of the brain causes secretion of saliva, that, therefore, that part contains the "gustatory centre." He finds that the influence of cortical irritation on secretion is wholly indirect.

The results of the destruction of motor areas are considered much more briefly than those of irritation. The author holds that physiology must here yield the palm to pathology, since conclusions regarding loss of function are less reliable when derived from the observation of animals, than when based on the statements of patients. He prefers, therefore, to draw practical conclusions from such collections of cases as have been made by Charcot and Pitres, rather than to record the results of experiment. In this he is supported hy Charcot, who commends, in his preface to the work, the willingness of the physiologist to give a place to clinical observation.

The book should be studied carefully by those who are interested either in nervous physiology or in the subject of Jacksonian epilepsy. M. A. S.